INTRODUCTION

ISS Becoming Reality

1998 marked the first step in a new era of space development – the launch and in-orbit assembly of the first two elements of the ISS, Zarya and Unity. The ISS is the culmination of decades of planning and design and represents a level of international collaboration unprecedented in the history of space flight. Over the next six years, the ISS will continue to take form, providing industry, academia and governments with the ability to conduct research in an advanced orbital facility with capabilities not currently reproducible on Earth.

The ISS also represents a significant investment in financial terms, a level not seen in a civil space program since the Apollo era. Even with the international program cost-sharing strategy, the U.S. government will continue to shoulder a significant portion of the overall costs of development, assembly and operation of the ISS.

There are several driving forces behind NASA's current effort to "commercialize" the ISS. The 1984 amendment to the NASA Act of 1957 obligates NASA to promote the commercialization of space. More recently, the 1998 Commercial Space Act required that NASA actively seek commercial users for the ISS.

> "...the use of free market principles in operating, servicing, allocating the use of and adding capabilities to the Space Station, and the resulting fullest possible engagement of commercial providers and participation of commercial users will reduce Space Station operational costs for all partners and the Federal Government's share of the United States burden to fund operations."

Meaningful commercial utilization of the ISS will have another positive side effect for NASA. It will ease the Operations and Utilization (O&U) burden NASA must carry, currently projected to be $1.3 billion annually. Successful commercial use of the ISS may further NASA's ability to pursue other critical non-ISS missions.

NASA's stated intention is to allocate 30% or more if unsubsidized demand emerges, of the U.S. portion of the ISS resources for commercial use. It is apparent from the definition of resources that this allocation will be flexible, driven largely by the availability of various resources (crew time, power, rack space etc.) and interest levels of the private sector. Regardless of the metric or combination of metrics that are used to determine the 30% allocation of ISS resources, the intent is clear – NASA desires to provide a commercial space based platform that, if successful, could establish the foundation for a private growth market involving human operations in space.

Assumptions

KPMG developed this report using the following set of framing assumptions:

- U.S. Domestic – Although the ISS is an international partnership, the focus of this report was on the potential for commercialization within the context of the U.S. portions of the facility. As such, we did not examine international opportunities or US/International cooperative efforts for commercial utilization of ISS;

- Commercial-related – While there are many applications for the capabilities of the ISS by government, non-profit, or university user communities, those fell outside the scope of this work;

- ISS-related – The scope of all potential commercial activity in space is expanding, and much of the proposed activity has little or nothing to do with the ISS platform (e.g., hotels in space). We therefore included only ISS-related data.

Definitions

As a result of the rapid growth in commercial activity in space, primarily in telecommunications, there have been growing political and fiscal imperatives within government to transition the majority of the government's space operations to the private sector. This has become apparent in both the civil and military spheres of space. Within the last several years, NASA has initiated the first steps on multiple large-scale programs to privatize key space operations. Much of the current Department of Defense (DoD) long-range planning also relies heavily on the leveraging of commercial communications, launch and imaging services.

Before we may quantify the potential for commercial utilization of ISS, it is important to understand the spectrum of operational approaches between pure government and pure commercial. To maintain consistency within this discussion, we have chosen to define the following four categories of space activity: pure government, privatization, commercialization and pure commerce.

We have endeavored to develop a "Commercialization Matrix" (Figure 1) that represents the various ISS assets, development, operations, utilization, and augmentation while introducing the concept of commercial migration.

Pure Government

Pure Government space activity is defined as a government entity such as NASA, conducting its activities through the purchase of products and services from government contractors. The ISS program is currently 100% government financed for design, development and assembly. Even early utilization of the research and development assets of the ISS will be dominated by government supported researchers.

Privatization

"Privatization involves a private sector, profit-seeking entity carrying out functions previously the responsibility of government. The government is still the sole or primary customer for these activities and funds the private entity to carry them out. The objectives of privatization include using the presumed efficiencies of the private sector to reduce the cost of the activities that are privatized, thereby reducing the demands on the government budget; to remove the government from direct involvement from activities that are carried out on a repetitive basis; and to reduce the number of government employees involved in such activities."[2]

The efforts of NASA to privatize the shuttle operations through the Space Flight Operations Contract (SFOC) and their ground control network through the Consolidated Space Operations Contract (CSOC) are the best recent examples of privatization.

Commercialization

The second stage of commercial activity in space commercialization occurs when the government makes available to a private entity a public asset, or control of that asset to be used in serving the needs of both government and commercial customers.

Pure Commerce

The final stage of private industry moving into space activities we have defined as "Pure Commerce." This involves a private sector profit-seeking entity using private capital to carry out activities intended to result in products or services that can be sold at a profit through the marketplace to private sector customers, both in space and on Earth. Examples of such could be either privately built space hardware – potentially connected to the ISS – leased to both commercial and government users, or the licensing of the ISS logo and imagery for use in commercial products and services.

[2] Logsdon, John: "Commercializing the International Space Station: current US thinking."

FIGURE 1: COMMERCIALIZATION MATRIX